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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/673,052

09/26/2003

Phillip Joe Brock

HSJ9-2003-137-US1

1240

23980

7590

02/02/2007

MINTZ, LEVIN, COHN, FERRIS, GLOVSKY AND POPEO, P.C  
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EXAMINER

NUTTER, NATHAN M

ART UNIT

PAPER NUMBER

1711

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/02/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/673,052

Applicant(s)

BROCK ET AL.

Examiner

Nathan M. Nutter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 20-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of Group I, claims 1-19, in the reply filed on 23 June 2006 is acknowledged.

### ***Response to Amendment***

In response to the arguments filed 4 December 2006, the following is placed in effect.

The rejection of claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the use of furan, bis(furan), tris(furan) and tetrakis(furan) for the diene compound and for the use of maleimide or a plurality of maleimide group containing compounds for the dienophile component, does not reasonably provide enablement for dienes and dienophile compounds, is hereby expressly withdrawn.

The rejection of claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, is hereby expressly withdrawn.

The rejection of claims 15-17, only, under 35 U.S.C. 103(a) as being unpatentable over Jen et al (US 2004/0266954), is hereby expressly withdrawn.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 10, 12-14, 18 and 19 are rejected under 35 U.S.C. 102(a) as being anticipated by Jen et al (US 2004/0266954).

The reference to Jen et al shows the production of a Diels-Alder reversible resin composition, as claimed herein, using furan compounds (diene of claims 5 and 6) with a protected (furan-capped) maleimide compound (dienophile of claims 10 and 12-14).

Note paragraphs [0010] and [0020] for the broad concept, paragraphs [0030]-[0031] for the furan-capping of the maleimide, which at paragraph [0033] is to prevent crosslinking prior to the "lattice hardening step" and is later, paragraph [0034], cleaved for the reaction to proceed. The recitations in claims 2-4 regarding the particular viscosity are deemed to be anticipated by the reference as being inherent since all other parameters are identically disclosed, and nothing in the claims can be seen as to differentiate over the reference. Further, the recitations of characteristics in claims 18 and 19 is deemed to be inherent for the same reasons, identical components with nothing to differentiate the claims over the reference.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jen et al (US 2004/0266954).

The reference to Jen et al shows the production of a Diels-Alder reversible resin as claimed herein, using furan compounds (diene of claims 5 and 6) with a protected (furan-capped) maleimide compound (dienophile of claims 10 and 12-14). Note paragraphs [0010] and [0020] for the broad concept, paragraphs [0030]-[0031] for the furan-capping of the maleimide, which at paragraph [0033] is to prevent crosslinking prior to the "lattice hardening step" and is later, paragraph [0034], cleaved for the reaction to proceed. The reference does not teach the protection of the diene component.

It is submitted that the reference teaches sufficiently that the dienophile moiety is protected to prevent the reaction from proceeding until which conditions are set, e.g. rise in temperature, as herein, the protecting group is cleaved. This concept is used widely throughout the chemical arts, for example in synthetic nucleotide processes, for the very reason set out in Jen et al. The use of a protected diene, as opposed to the dienophile, would be an obvious modification to a skilled artisan. Only one of the two is needed to be protected, and with only two components, either one would be suitable. As such, the claims are deemed to be obvious.

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Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jen et al (US 2004/0266954), cited and for the reasons set out above, taken with Small et al (US 6,271,335).

The reference to Jen et al shows the production of a Diels-Alder reversible resin as claimed herein, using furan compounds (diene of claims 5 and 6) with a protected (furan-capped) maleimide compound (dienophile of claims 10 and 12-14). Note paragraphs [0010] and [0020] for the broad concept, paragraphs [0030]-[0031] for the furan-capping of the maleimide, which at paragraph [0033] is to prevent crosslinking prior to the "lattice hardening step" and is later, paragraph [0034], cleaved for the reaction to proceed. The reference does not teach the protection of the diene component.

The reference to Small et al shows the production of a Diels-Alder reversible resin as claimed herein, using furan compounds, including bis-, tris- and tetrakis(furan) (diene of claims 5-8) with a maleimide compound (dienophile of claims 10 and 11). Note the Abstract and column 1 (lines 52-68) for the basic concept. Note column 3 (lines 42-56) for the dienophile employed, and the paragraph bridging column 3 to column 4 for the dienes employed. Further, note Example 1 which shows a silicon containing diene as recited in claim 9.

The reference to Jen et al does not show the use of bis(furan), tris(furan) or tetrakis(furan) moieties in their reaction. These constituents are taught as being conventional for reversible Diels-Alder reactions, as herein claimed. Use thereof in view of Small et al would be within the skill of an artisan. Further, Jen et al do not show a

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silicon containing diene, as disclosed by Small et al. Again, it would have been within the skill of an artisan to employ such in the composition of Jen et al based upon the disclosure of Small et al.

The reference to Jen et al teaches sufficiently that the dienophile moiety is protected to prevent the reaction from proceeding until which conditions are set, e.g. rise in temperature, as herein, the protecting group is cleaved. This concept is used widely throughout the chemical arts, for example in synthetic nucleotide processes, for the very reason set out in Jen et al. The use of a protected diene, as opposed to the dienophile, would be an obvious modification to a skilled artisan. Only one of the two is needed to be protected, and with only two components, either one would be suitable. As such, the claims are deemed to be obvious.

### ***Response to Arguments***

Applicant's arguments filed 4 December 2006 have been fully considered but they are not persuasive.

Claims 1-6, 10, 12-14, 18 and 19 are rejected under 35 U.S.C. 102(a) as being anticipated by Jen et al (US 2004/0266954), it is pointed out that the PSDACLD described in paragraph [0039] of Jen et al is an example thereof. Applicants are reminded that a reference is taken for the entirety of its teachings and not for isolated passages contained therein. It is further pointed out that this PSDACLD is the product. The instantly claimed invention, likewise, produces a solid product. See the last line of instant claim 1. Further, paragraph [0078] discloses the liquids employed initially, as herein claimed, as "the reaction mixture was allowed to stir at room temperature for 12

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h," which is indicative of liquids. The broad disclosure of Jen et al teaches the identical constituents for the identical reaction, e.g. a reversible Diels-Alder polymerization reaction. As in the instant claims, the reaction begins as liquids and progresses to a solid. Applicants are confusing the reaction product with the constituents from which it is made. Applicants mischaracterize the Jen et al reference as being "directed to a *single, solid* material that contains Diels-Alder reactive groups," when the reference is directed to *producing* a solid state material, just as herein claimed. the reference teaches the same constituents, in the same liquid state (to "stir at room temperature") to produce the same result, e.g. that may undergo a reversible Diels-Alder polymerization.

With regard to the rejection of claims 1-6, 10 and 12-14 under 35 U.S.C. 103(a) as being unpatentable over Jen et al (US 2004/0266954), applicants' attention is directed once more to paragraph [0078] of the reference. It is further pointed out to applicants that the instant claims, if the reaction mixture proceeds, forms a solid product. Again, see claim 1.

With regard to the rejection of claims 1-19 under 35 U.S.C. 103(a) as being unpatentable over Jen et al (US 2004/0266954) taken with Small et al (US 6,271,335), it is pointed out that Small et al teach the same reactions, but does not characterize their constituents broadly as dienes and dienophiles, as herein recited. Jen et al teach the use of protecting groups. If the reference to Small et al taught each and every facet of the invention as applicants seem to require of the reference, the reference would have been employed in a rejection of the claims under 35 USC 102, not as herein applied. The reference is relied upon for the reasons set out in the rejection. Again, applicants'



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attention is directed to paragraph [0078] wherein the reactants are stirred as liquids. In response to applicant's argument that Small et al is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the reactants of Jen et al embrace those recited and claimed herein. The art is certainly analogous. Both references do not have to show each and every limitation of each claim for a rejection thereover. If that were the case, an art rejection over each reference would be in order. It is also pointed out that applicants limit their arguments to only one example, while a reference is viewed for the entirety of its teachings.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

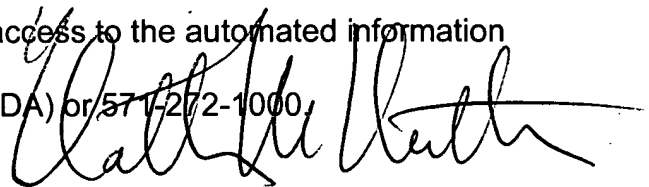
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan M. Nutter whose telephone number is 571-272-1076. The examiner can normally be reached on 9:30 a.m.-6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James J. Seidleck can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Nathan M. Nutter  
Primary Examiner  
Art Unit 1711

nmn

29 January 2007